REMARKS

Claims 1-4, 7-15, 17-20, 22, 24, 26, 28 and 29 are pending in the application.

Objection to the Specification

The specification has been objected to under 35 USC § 112, first paragraph, as failing to provide an adequate written description of the invention and for failing to provide an enabling disclosure. It is Applicant's contention that the Examiner has failed to fulfill his burden under the enablement requirement by not specifically identifying why one skilled in the art could not supply the alleged undisclosed information without undue experimentation. See MPEP 2164.04. Further, it is Applicant's contention that the Examiner has failed to fulfill his burden with regard to the written description requirement by not presenting by a preponderance of the evidence why a person skilled in the art would not recognize in Applicant's disclosure a description of the invention defined by the claims. See MPEP 2163.04.

In general, Applicant submits that the objections noted by the Examiner with respect to the specification are in the realm of what are more properly considered questions as to the specific manufacturing specifications for a preferred embodiment of the invention. It is well settled that while a patent specification must be enabling, the disclosure does not need to provide details at a level that would enable one to manufacture the invention as if the disclosure were a manufacturing engineering drawing. (See *In re Gay*, 135 USPQ 311; *Douglas v. United States*, 184 USPQ 613).

The arguments expressed in this response regarding enablement and opinions about common knowledge or ability of a person with ordinary skill in the art are made assuming that such person has read the present application.

Regarding the formation of conducting spheres and the manner of heat shrinking, metal fabricators currently exist who manufacture standard metallic spheres and who will additionally manufacture specialty spheres, such as the spheres described in the present application. Because the specification adequately discloses to one skilled in the relevant art how to make the spheres without undue experimentation, it is enabling. See Genentech, Inc. v. Novo Nordisk, 42 USPQ2d 1001.

With respect to the reduction in any influence that may cause a non-harmonic electromagnetic wave pattern, it is common knowledge to those skilled in the relevant art that the goal of this is to reduce coronal discharge, or arcing, which may damage high-voltage equipment.

Steps to be taken to insure that the entire cavity is filled completely include, for example, "vibration in the presence of a vacuum during the filling process," as described on page 16, 3rd full paragraph. Further, one skilled in the art could easily look in the orifice before it is plugged to determine the level of fill.

Regarding the anode/cathode conducting spheres being larger multiples of the reactor core [wavelength], it is common knowledge to one skilled in the art that a multiple means any number to which the size of the reactor core may be multiplied to produce a larger conducting sphere.

The size of the conducting sphere divot is not an absolute number, but is determined by three variables, as can be seen by inspection of Fig. 6; the thickness of conducting layer 118, the thickness of the seventh non-conducting layer 127, and the diameter of the conducting sphere. It

is evident that one skilled in the art would be able to determine this divot size without undue experimentation.

With respect to the harmonics of the electromagnetic fields without the divot, it is common knowledge to those skilled in the art of high voltage test equipment that arcing may occur without this contact.

As to the dimensions of the laser port holes, these dimensions are a design detail that has readily been addressed in the design of currently used inertial confinement fusion reactors and are thus known to those skilled in the art of fusion reactor design.

Regarding the objection to the conducting sphere track size dimensions, as discussed above, the conducting spheres may be larger multiples of the reactor core. The diameter of the core and conducting spheres determines the dimension of the inner wall of the track. Thus, the track size determination is based directly on the desired conducting sphere size. Also, concrete that is essentially non-conducting and non-conducting concrete reinforcement fibers are common knowledge in the concrete industry. One skilled in the art of cement manufacturing would possess the necessary skills to make non-conductive cement without undue experimentation.

With respect to the padding, the temperatures encountered are again dependent on the size of system desired. As manufacturers of varying types of padding abound, one skilled in the art of padding manufacturing would have the knowledge to construct such padding without undue experimentation.

As the specification states on page 21, 2nd full paragraph, the slope of the trough is towards the center to gently pull the conducting spheres inward by the force of gravity. It is common knowledge that gravitational force will act on a mass. If the mass is on a slope, a vector

component of that gravitational force down the slope will tend to move the object in that vector direction. In the case of the conducting spheres, one skilled in the art of dynamics would know without undue experimentation that the force required to move the spheres toward the center is a function of the mass of the spheres and the coefficient of friction between the sphere and track contact surface. Thus, it is envisioned that a wide range of slopes may be used for that purpose.

Regarding the coolant pipes and materials of construction, the heat produced that is then required to be extracted is a function of the desired output wattage and therefore not an absolute value. It is Applicant's contention that those skilled in the art of heat transfer have the required knowledge to size the piping to extract such heat without undue experimentation. Further, the materials of construction of these pipes will depend on the coolant used, of which examples given in the specification, page 21, 3rd full paragraph, include water and Flourinert®, both of which are known in the art.

Regarding the objection to the sliding shield dimensions, as discussed above, the conducting spheres may be larger multiples of the reactor core. The diameter of the core, conducting spheres, and subsequent size of the track determine the dimension of the sliding shield. Thus, the track size determination is based indirectly on the desired conducting sphere size.

As to the objection to the coil lead and hemispherical coil dimensions, as discussed above, the conducting spheres may be larger multiples of the reactor core. The diameter of the conducting spheres determines the dimension of the hemispherical coil. Further, the actual coil lead size depends on the desired output of the reactor. It is Applicant's contention that those

skilled in the art of high voltage wiring have the required knowledge to size the leads based on the output wattage without undue experimentation.

With respect to the numerous sensors, Applicant submits that the focus of that section of the specification is on the ability to monitor various physical conditions of the system. The exact identity of those parameters is dependent on the final configuration of the system and would be common knowledge to those skilled in the art of nuclear fusion reactor design once a design in accordance with the present invention has been selected.

Concerning the inner shield clamp, again, the size of the inner shield is dependent upon the size of the reactor core and anode/cathode conducting spheres. It is further Applicant's contention that those skilled in the art of nuclear fusion reactor design will have the required knowledge to specify the materials of construction of this clamp without undue experimentation.

Regarding the pumping rate of coolant through the middle reactor shield, the heat produced that is then required to be extracted is a function of the desired output wattage and therefore not an absolute value. It is Applicant's contention that those skilled in the art of heat transfer have the required knowledge to calculate a rate to extract such heat without undue experimentation.

With respect to the monitoring of coolant in the conductor pedestal, it is Applicant's contention that those skilled in the art of heat transfer have the required knowledge to monitor the coolant without undue experimentation and would recognize in the disclosure an adequate description of the pedestal design.

As to the gaskets, the size of the middle reactor shield is dependent upon the size of the reactor core. Further, Applicant contends it is common knowledge to those skilled in the art of gasket design to select a suitable gasket material for the stated purpose.

The design power level of the reactor is completely dependent on the desired end product and therefore cannot have an absolute value.

The positioning of pellets in an inertial confinement reactor is well known in the art of fusion reactor design and the disclosed prepositioning of the pellets has been used in previous designs.

Regarding the laser type required, again, the use of lasers to implode pellets in an inertial confinement reactor is well known in the art of fusion reactor design and the disclosed use of lasers for this purpose has been used in previous designs. Further, the energy required is completely dependent on the desired output of the reactor and therefore cannot have an absolute value.

As mentioned above with regard to the diameter of the laser ports, these dimensions are a design detail that has readily been addressed in the design of currently used inertial confinement fusion reactors and is thus known to those skilled in the art of fusion reactor design. Again, the output of the reactor is a determining factor.

With respect to the pellet implosion, Applicant contends it is common knowledge in the art of fusion reactor design as to what is required to correctly obtain a spherical fusion burn. Therefore, the disclosure also adequately describes the necessary parameters to one skilled in the art of fusion reactor design.

The positioning of lasers to minimize "blind spots" by aiming them "slightly off-center" is common knowledge to those skilled in the art of fusion reactor design.

Regarding the diameter of the fuel pellets, it is common knowledge in the field of fusion reactor design that various companies manufacture these pellets. Further, the specific size of the fuel pellet is a design detail that has readily been addressed in the design of currently used inertial confinement fusion reactors and is thus known to those skilled in the art of fusion reactor design.

Tests of the type mentioned on page 27, 1st full paragraph, are commonly done in inertial confinement nuclear reactors and are common knowledge to those skilled in the art of nuclear fusion reactor design.

Regarding the omission of the inner shield clamp, Applicant believes it would be obvious to one skilled in the art of nuclear fusion reactor design to compare the output of the reactor with the inner shield clamp and the output without the inner shield clamp to determine whether the harmonics of the reactor core have been disrupted.

With respect to the layering of hemispherical coils, Applicant asserts that it is common knowledge for those skilled in the art of building high-Tesla coils on how to layer the coils, how to embed them in materials, and how to cure the materials to reduce the chance of failure.

Regarding the siphoning off of excess electricity, this is outside the scope of the claimed invention. As to the oval track design, Applicant submits that page 76, last paragraph, adequately discloses the improvement in harmonics with this design.

With respect to the connection of the reactor core to the electric power grid, this is outside the scope of the claimed invention. As to specific statement a), the ceramics mentioned

on page 17, hafnium diboride silicon carbide and zirconium diboride composite are examples of such.

As to specific statement b), as mentioned above, the power levels are user-desired parameters and therefore do not have absolute values.

As to specific statement c), as mentioned above, these reactor core materials and laser energies are design details that have readily been addressed in the design of currently used inertial confinement fusion reactors and are thus known to those skilled in the art of fusion reactor design.

As to specific statement d), these are design details that have readily been addressed in the design of currently used inertial confinement fusion reactors and are thus known to those skilled in the art of fusion reactor design.

As to specific statement e), this is a design detail that has readily been addressed in the design of currently used inertial confinement fusion reactors and is thus known to those skilled in the art of fusion reactor design.

As to specific statement f), this type of testing is commonly done in inertial confinement nuclear reactors and is common knowledge to those skilled in the art of nuclear fusion reactor design.

As to specific statement g), this type of testing is commonly done in inertial confinement nuclear reactors and is common knowledge to those skilled in the art of nuclear fusion reactor design. This duration is a typical duration for inertial confinement nuclear reactors.

As to specific statement h), this type of testing is commonly done in inertial confinement nuclear reactors and is common knowledge to those skilled in the art of nuclear fusion reactor design.

As to specific statement i), this type of testing is commonly done in inertial confinement nuclear reactors and is common knowledge to those skilled in the art of nuclear fusion reactor design.

As to specific statement j), the capacitors needed are dependent on the output required, and as mentioned above, the power levels are user-desired parameters and therefore do not have absolute values.

As to specific statement k), again, for commercial operation, the magnetic field will vary from reactor to reactor depending on its size and other variables.

As to specific statement l), this phrase has been changed to read "The invention operates as follows."

As to specific statement m), this phrase has been removed.

As to specific statement n), the absence of a reactor core is already known to those skilled in the art of nuclear fusion system design, and is disclosed as the No-Core design on page 72.

As to specific statement o), this phrase has been changed to read "To summarize, the initial reactor core 101 is designed as follows:"

As to specific statement p), a variation of this kind would be common knowledge to those skilled in the art of nuclear fusion reactor design.

Upon the meeting of the burden of proof by Examiner, Applicant is prepared to supply the Examiner with references detailing Applicant's assertions of what is knowledge to those in

the various arts above. Applicant respectfully submits the corrected specification for approval and that the above objections to the specification be withdrawn.

Claim Rejections -- 35 USC § 101

Claims 1-4, 7-15, 17-20, 22, 24, 26, 28, and 29 stand rejected under 35 USC § 101. Applicant respectfully suggests that the Examiner has not fulfilled his burden of proof with respect to the requirement of utility. "The PTO has the initial burden of challenging a patent applicant's presumptively correct assertion of utility." *In re Swartz*, 56 USPQ2d 1703. Further, "[i]f the PTO provides evidence showing that one of ordinary skill in the art would reasonably doubt the asserted utility, however, the burden shifts to the applicant to submit evidence sufficient to convince such a person of the invention's asserted utility." *Id.*

While the Examiner has put forth asserted arguments as to why the invention as disclosed is inoperative, the Examiner has not provided any evidence showing that one of ordinary skill in the art would doubt the utility of the invention.

Further, while the Examiner suggests that the Applicant must submit sufficient substantiating evidence of operability where the utility of the claimed invention is based upon allegations that border on the incredible or that would not be readily accepted by a substantial portion of the scientific community, the initial burden of coming forward with evidence showing such a doubt is on that must first be met by the Examiner and not by the Applicant.

Applicant also respectfully suggests that the scope of the claimed invention cannot be classified as "incredible." The believability of using nuclear fusion to generate energy is well established. The Applicant's invention stems from the initiation and creation of a spherical

electromagnetic field for a nuclear fusion system. The design of magnetic containment fields for nuclear fusion systems has been and will continue to be a subject of research and invention. As such, Applicant respectfully submits that there is really nothing incredible either about the utility of the present invention (a nuclear fusion system) or the particular field of the invention (design of a magnetic containment field).

The Examiner has cited several cases in this rejection. *In re Houghton*, 167 USPQ 687, concerns a claim to a flying machine that flaps with "wings." *In re Ferens*, 163 USPQ 609, claims hair growth on denuded parts of the body. *Puharich v. Brenner*, 162 USPQ 136, claims a device that expands extra sensory perception. *In re Pottier*, 153 USPQ 407, involved shocking hydrated plantlets to extreme cold to reduce the size of the mature plant and affect its resistance to cold. *In re Ruskin*, 148 USPQ 221, claimed increasing the energy release of fossil fuels by processing them to increase their diamagnetic properties. *In re Citron*, 139 USPQ 516, involved a treatment of cancer using a serum with newly created antibodies (1963). *In re Novak*, 134 USPQ 335, claimed an organic compound with questionable properties in light of the present knowledge. While these cases may describe what were considered "incredible" inventions at the time, and while operable cold fusion may still today qualify as "incredible," none of the cases include the subject matter that Applicant claims.

In *Swartz*, the claims at issue were directed to a process of cold fusion. The Patent Office provided several references showing that results in the area of cold fusion were irreproducible, therefore providing evidence that those skilled in the art would reasonably doubt the asserted utility and operability of cold fusion. Applicant respectfully suggests that the Examiner proceed

in a similar manner with regard to the area of magnetic containment fields for nuclear fusion systems.

Upon the meeting of the burden of proof by the Examiner, Applicant is prepared to provide the Examiner with evidence of operability of the claimed invention.

As such, Applicant respectfully requests that the rejection to claims 1-4, 7-15, 17-20, 22, 24, 26, 28, and 29 under 35 USC § 101 be withdrawn.

Claim Rejections -- 35 USC § 112

Claims 1-4, 7-15, 17-20, 22, 24, 26, 28, and 29 stand rejected under 35 USC § 112, first paragraph. Applicant respectfully suggests that the Examiner consider the responses to the specification objections under 35 USC § 112, first paragraph, as relevant.

Applicant further contends that the Examiner consider the response to the rejection of claims 1-4, 7-15, 17-20, 22, 24, 26, 28, and 29 under 35 USC § 101. "If the claims in an application fail to meet the utility requirement because the invention is inoperative, they also fail to meet the enablement requirement . . . ." *In re Swartz*, 56 USPQ2d 1703. It is Applicant's contention that withdrawal of the rejection under 35 USC § 101 will directly relieve Applicant of the rejection under 35 USC § 112.

As such, Applicant respectfully requests that the rejection to claims 1-13, 14-15, and 17 under 35 USC § 112 be withdrawn.

Claim Rejections -- 35 USC § 103

Claims 1-3, 10, 11, 20, 22, 24, 26, and 29 stand rejected under 35 USC § 103(a) as being unpatentable over Teleki in view of Dawson. Applicant respectfully suggests that Dawson

describes not a spherical magnetic field, but a toroidal magnetic field. This type of magnetic field is widely known in the art, as evidenced by Applicant on pages 3-4 ("A number of reactor designs use toroidally-shaped confinement arrangements for the reactor, or variations on a toroidally-shaped reactor."). It is precisely the spherical electromagnetic confinement field that is the invention of Applicant. Neither Teleki nor Dawson suggest this type of containment field, nor is there any motivation in the prior art to create such a field.

Further, the Examiner has not read all of the necessary elements of Applicant's claim language onto the cited references.

As such, Applicant respectfully requests that the rejection to claims 1-3, 10, 11, 20, 22, 24, 26, and 29 under 35 USC § 103(a) be withdrawn.

Conclusion

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

Brad Pedersen
Registration No. 32,432

Customer No. 24113
Patterson, Thuente, Skaar & Christensen, P.A.
4800 IDS Center
80 South 8th Street
Minneapolis, Minnesota 55402-2100
Telephone: (612) 349-5774

Application No. 09/939,316

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Application No. 09/939,316

ATTACHMENT
REDLINED AMENDMENT

Specification As Amended

Please substitute the following amended paragraph(s) and/or section(s):

Page 36, line 12:

[It is believed that] T[t]he invention operates as follows:

Page 59, lines 24-27:

[If the reactor core 101 can be engineered to have enough strength, heat dissipation capability, and current carrying capability—greater than the rate at which energy is released by the fusion burn—then it would be possible to contain the plasma until the fusion fuel is almost totally consumed.] Fusion burns of minutes or even hours in duration are possible.